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Title: Dealiasing GRACE: the high-frequency ocean response to wind and pressure.

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Abstract:

When estimating one gravity field model from 4-8 weeks of intersatellite range data, mass variations in the Earth with periods of hours to a few days will alias the monthly (or longer) estimate. Chief among these are tides. Next in size is short period variability of the atmosphere, and the short period variability it induces in the ocean.
This presentation details current plans to dealias GRACE from short period ocean mass relocation induced by atmospheric pressure and wind. The details of a barotropic ocean model and its forcing, tests of its output against bottom pressure and altimetric data, result of efforts to optimize the bathymetry, friction coefficient, and side friction are all given. Most of the verifications of this and prior models (Hirose et al., 2000; Tierney et al., 2000; Stammer et al, 2000) have been done against Topex/Poseidon (T/P) altimetric data, but there are distinct differences between the needs of GRACE and those of T/P. The empirical tidal model applied to altimetry removes the effect of thermally-driven atmospheric 'tides', so coordination between the tidal and atmospheric models is essential. GRACE data for at least 30 days, and perhaps 60 days, might need to be combined for one gravity inversion (vs 10 days for T/P), hence baroclinicity is not negligible, although its effect increases dramatically at periods longer than ~ 100 days. Assuming the errors of the model are only due to uncertainty in forcing fields and lack of baroclinicity, we estimate the former by forcing the model with NCEP vs ECMWF fields, and the latter by the differences between the fully baroclinic ECCO model configuration (http://ecco.jpl.nasa.gov), and its barotropic component.